RADIATION PROTECTION PROGRAM *(RPP)*

This plan:

Implements the regulations contained in the most current revision of Title 10, Code of Federal Regulations, Part 835.

Comments and questions regarding this plan should be directed to the contact person listed below:

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Sign-off Record:

Approved by: _____ Date: _____
Radiation Safety Officer

Approved by: _____ Date: _____
Manager, ESH&A Office

Approved by: _____ Date: _____
Laboratory Deputy Director

Approved by: _____ Date: _____
Laboratory Director

Approved by: _____ Date: _____
DOE, Ames Area Office

1.0 REVISION/REVIEW LOG

This document will be reviewed every three years as a minimum.

Revision Number	Effective Date	Contact Person	Pages Affected	Description of Revision
4	06/01/00	Hokel	selected	RPP revised based on DOE comments
5	06/01/03	Beckel	Section 3.0	Minor editorial changes

2.0 SUMMARY

This Radiation Protection Program (RPP) applies to the activities described in the Scope of Radiological Operations (see below) of the Ames Laboratory, which is presently operated under contract to the Department of Energy by Iowa State University. It constitutes Ames Laboratory's implementation plan for the requirements of 10 CFR Part 835, *Occupational Radiation Protection*. It contains a description of Ames Laboratory's current compliance status and the means by which the Laboratory intends to comply fully with all applicable requirements of 10 CFR 835. Implementation of the RPP does not significantly impact upon any programs or activities not included in the plan.

Each requirement and recommendation of 10 CFR 835 is explicitly addressed in this format. Justification is given for all instances in which it is determined that a requirement of the Regulation is not applicable to Ames Laboratory. Ames Laboratory is not exempt from any requirements of the Regulation. The table in section 5 of this document summarizes Ames Laboratory's compliance status with the requirements of 10 CFR 835.

3.0 SCOPE OF RADIOLOGICAL OPERATIONS

Ames Laboratory is a U.S. Department of Energy (DOE) Laboratory seeking solutions to energy-related problems through research involving the exploration of chemical, engineering, environmental, materials, mathematical, and physical sciences.

A limited number of Laboratory research activities utilize small quantities of radioactive materials and/or radiation produced by analytical x-ray systems. There are three general categories of ionizing radiation sources used at Ames Laboratory.

I. Very small quantities of source materials (i.e., thorium, uranium, depleted uranium) are utilized for research. The source materials are maintained in individual Materials Balance Areas and reported to DOE. The Laboratory does not possess sufficient quantities of source and special nuclear material to be classified as a "nuclear facility" and is currently specified as a category IV facility for purposes of the Materials Control and Accountability program. Research involving the use of these materials has been

varied in the past, involving such projects as purification of isotopes for use at other research facilities, nebulization of materials and study of the nebulized materials using lasers, etc. There are minimal activities being performed with these materials at the Laboratory. The Laboratory maintains only a small inventory of the materials; periodically the Laboratory receives requests from other facilities for small quantities of purified material, (e.g., crystal bar thorium), which are sent as limited quantity shipments.

II. Small quantities of sealed and unsealed radioactive materials are used as check sources and calibration sources or are specifically ordered for use in short-term research projects. Some research may involve the use of small, low activity neutron-activated metal sources.

III. Analytical, x-ray systems are utilized by several research groups.

Although the amounts of radioactive material commonly used in research at the Laboratory are usually small (uCi or mCi) and the dose rates are usually far less than 100 millirems per hour, radiological conditions are monitored by the Health Physics Group. Radiological conditions in the research areas are evaluated through review of survey data, dosimetry records, special radiological monitoring and/or analytical measurements, and other means described in this RPP document.

New activities or modifications to approved activities involving the use of any source of ionizing radiation must be approved through the Ames Laboratory Readiness Review process before beginning operations. Occupational exposures, as a result of the use of sources of ionizing radiation at Ames Laboratory, are consistently considerably less than the limits set forth in 10 CFR 835.

Areas of low-level contamination exist in some buildings of the Laboratory as a result of DOE historical research and production activities, but only in areas not routinely entered by employees. These areas are posted and any work in any contaminated area is performed using specific Radiological Work Permits.

4.0 ALARA STATEMENT

ALARA is Ames Laboratory's approach to radiological protection, used to manage and control exposures (individual and collective) to employees, visitors, and the general public to be As Low As Reasonably Achievable. ALARA is not a dose limit, but is a philosophy for devising processes, procedures and operations so as to maintain doses within applicable limits and as far below them as can be reasonably achieved. Ames Laboratory's policies and procedures are consistent with the ALARA philosophy.

It is the policy of Ames Laboratory to conduct its activities in such a manner that worker and public safety, as well as protection of the environment, is given high priority. Ames Laboratory management is committed to maintaining risks to safety, health, or the environment that are associated with ionizing radiation or radioactivity at levels that are ALARA in all laboratory activities. Both individual and collective exposures, be they to laboratory workers, visitors, or members of the public, shall be maintained within appropriate

regulatory limits and as far below them as social, technical, economic, practical and public policy considerations permit.

5.0 COMPLIANCE STATEMENTS

REFERENCE	REQUIREMENT TEXT	STATUS	COMPLIANCE STATEMENT
Appendix A	The data presented in appendix A are to be used for controlling individual internal doses in accordance with § 835.209, identifying the need for air monitoring in accordance with § 835.403, and identifying and posting airborne radioactivity areas in accordance with § 835.603(d).	Full	Ames Laboratory policies and procedures are consistent with these requirements.
Appendix A	The DAC values are given for individual radionuclides. For known mixtures of radionuclides, determine the sum of the ratio of the observed concentration of a particular radionuclide and its corresponding DAC for all radionuclides in the mixture. If this sum exceeds unity (1), then the DAC has been exceeded. For unknown radionuclides, the most restrictive DAC (lowest value) for those isotopes not known to be absent shall be used.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
Appendix A Footnote 1	A determination of whether the DACs are controlled by stochastic (St) or nonstochastic (organ) dose, or if they both give the same result (E), for each lung retention class, is given in this column. The key to the organ notation for nonstochastic dose is BS=bone surface, K=Kidney, L=Liver, SW=Stomach wall, and T=Thyroid. A blank indicates that no calculations were performed for the lung retention class shown.	Full	This is a statement that allows interpretation of the data presented in Appendix A and requires no action on the part of Ames Laboratory.
Appendix A Footnote 2	The ICRP identifies tritiated water and carbon as having immediate uptake and distribution; therefore no solubility classes are designated. For the purposes of this table, the DAC values are shown as being constant, independent of solubility class. For tritiated water, the inhalation DAC values allow for an additional 50% absorption through the skin, as described in ICRP Publication No. 30: Limits for Intakes of Radionuclides by Workers. For elemental tritium, the DAC values are based solely on consideration of the dose-equivalent rate to the tissues of the lung from inhaled tritium gas contained within the lung, without absorption in the tissues.	Full	This is a statement that allows interpretation of the data presented in Appendix A and requires no action on the part of Ames Laboratory.
Appendix A Footnote 3	A dash indicates no values given for this data category.	Full	This is a statement that allows interpretation of the data presented in Appendix A and requires no action on the part of Ames Laboratory.

REFERENCE	REQUIREMENT TEXT	STATUS	COMPLIANCE STATEMENT
Appendix A Footnote 4	These values are appropriate for protection from radon combined with its short-lived daughters and are based on information given in ICRP Publication 32: Limits for Inhalation of Radon Daughters by Workers and Federal Guidance Report No. 11: Limiting Values of Radionuclide Intake and Air Concentrations, and Dose Conversion Factors for Inhalation, Submersion, and Ingestion (EPA 520/1-88-020). The values given are for 100% equilibrium concentration conditions of the radon daughters with the parent. To allow for an actual measured equilibrium concentration or a demonstrated equilibrium concentration, the values given in this table should be multiplied by the ratio (100%/actual %) or (100%/demonstrated %), respectively. Alternatively, the DAC values for Rn-220 and Rn-222 may be replaced by 1 WL* and 1/3 WL*, respectively, for appropriate limiting of daughter concentrations. Because of the dosimetric considerations for radon, no f1 or lung clearance values are listed. *A "Working Level" (WL) is any combination of short-lived radon daughters, in one liter of air without regard to the degree of equilibrium, that will result in the ultimate emission of 1.3E+05 MeV of alpha energy.	Full	This is a statement that allows interpretation of the data presented in Appendix A and requires no action on the part of Ames Laboratory. Ames Laboratory policies and procedures are consistent with this statement.
Appendix C (a)	The data presented in appendix C are to be used for controlling occupational exposures in accordance with § 835.209, identifying the need for air monitoring in accordance with § 835.403 and identifying the need for posting of airborne radioactivity areas in accordance with § 835.603(d).	Full	Ames Laboratory policies and procedures are consistent with these requirements.
Appendix C (b)	The air immersion DAC values shown in this appendix are based on a stochastic dose limit of 5 rems (0.05 Sv) per year or a nonstochastic (organ) dose limit of 50 rems (0.5 Sv) per year. Four columns of information are presented: (1) radionuclide; (2) half-life in units of seconds (s), minutes (min), hours (h), days (d) or years (yr); (3) air immersion DAC in units of μCi/ml; and (4) air immersion DAC in units of Bq/m^3. The data are listed by radionuclide in order of increasing atomic mass. The air immersion DACs were calculated for a continuous, nonshielded exposure via immersion in a semi-infinite atmospheric cloud. The DACs listed in this appendix may be modified to allow for submersion in a cloud of finite dimensions.	Full	This is a statement that allows interpretation of the data presented in Appendix C and requires no action on the part of Ames Laboratory.

REFERENCE	REQUIREMENT TEXT	STATUS	COMPLIANCE STATEMENT
Appendix C (c)	The DAC value for air immersion listed for a given radionuclide is determined either by a yearly limit on effective dose equivalent, which provides a limit on stochastic radiation effects, or by a limit on yearly dose equivalent to any organ, which provides a limit on nonstochastic radiation effects. For most of the radionuclides listed, the DAC value is determined by the yearly limit on effective dose equivalent. Thus, the few cases where the DAC value is determined by the yearly limit on shallow dose equivalent to the skin are indicated in the table by an appropriate footnote. Again, the DACs listed in this appendix account only for immersion in a semi-infinite cloud and do not account for inhalation or ingestion exposures.	Full	This is a statement that allows interpretation of the data presented in Appendix C and requires no action on the part of Ames Laboratory.
Appendix C (d)	Three classes of radionuclides are included in the air immersion DACs as described below. (1) Class 1. The first class of radionuclides includes selected noble gases and short-lived activation products that occur in gaseous form. For these radionuclides, inhalation doses are negligible compared to the external dose from immersion in an atmospheric cloud. (2) Class 2. The second class of radionuclides includes those for which a DAC value for inhalation has been calculated, but for which the DAC value for external exposure to a contaminated atmospheric cloud is more restrictive (i.e., results in a lower DAC value). These radionuclides generally have half-lives of a few hours or less, or are eliminated from the body following inhalation sufficiently rapidly to limit the inhalation dose. (3) Class 3. The third class of radionuclides includes selected isotopes with relatively short half-lives. These radionuclides typically have half-lives that are less than 10 minutes, they do not occur as a decay product of a longer lived radionuclide, or they lack sufficient decay data to permit internal dose calculations. These radionuclides are also typified by a radioactive emission of highly intense, high-energy photons and rapid removal from the body following inhalation.	Full	This is a statement that allows interpretation of the data presented in Appendix C and requires no action on the part of Ames Laboratory.
Appendix C (e)	The DAC values are given for individual radionuclides. For known mixtures of radionuclides, determine the sum of the ratio of the observed concentration of a particular radionuclide and its corresponding DAC for all radionuclides in the mixture. If this sum exceeds unity (1), then the DAC has been exceeded. For unknown radionuclides, the most restrictive DAC (lowest value) for those isotopes not known to be absent shall be used.	Full	Ames Laboratory policies and procedures are consistent with these requirements.

REFERENCE	REQUIREMENT TEXT	STATUS	COMPLIANCE STATEMENT
Appendix D	The data presented in appendix D are to be used in identifying and posting contamination and high contamination areas in accordance with § 835.603(e) and (f) and identifying the need for surface contamination monitoring and control in accordance with § 835.1101 and 1102.	Full	Appendix D has been incorporated into Ames Laboratory policies and governs the identification and posting of contamination and high contamination areas in accordance with § 835.603(e) and (f), in addition to the monitoring and control for surface contamination in accordance with § 835.1101 and 1102.
Appendix D Footnote 1	The values in this appendix, with the exception noted in footnote 5 below, apply to radioactive contamination deposited on, but not incorporated into the interior or matrix of, the contaminated item. Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides apply independently.	Full	With the exception of the forms of Sr-90 specified in footnote 5 of appendix D, Ames Laboratory policies are specific in their application to radioactive contamination deposited on, but not incorporated into the interior or matrix of the contamination item. Ames Laboratory policies are consistent with this guidance and if surface contamination by both alpha- and beta/gamma-emitting nuclides exists, the limits established by § 835 Appendix D for alpha- and beta/gamma-emitting nuclides will apply independently.
Appendix D Footnote 2	As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.	Full	Ames Laboratory has accepted the definition for dpm, disintegrations per minute and has incorporated this definition into our plans, policies, and procedures, as appropriate.
Appendix D Footnote 3	The levels may be averaged over one square meter provided the maximum surface activity in any area of 100 cm^2 is less than three times the value specified. For purposes of averaging, any square meter of surface shall be considered to be above the surface contamination value if: (1) From measurements of a representative number of sections it is determined that the average contamination level exceeds the applicable value; or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm^2 area exceeds three times the applicable value.	Full	Ames Laboratory policies and procedures are consistent with this guidance.

REFERENCE	REQUIREMENT TEXT	STATUS	COMPLIANCE STATEMENT
Appendix D Footnote 4	The amount of removable radioactive material per 100 cm^2 of surface area should be determined by swiping the area with dry filter or soft absorbent paper, applying moderate pressure, and then assessing the amount of radioactive material on the swipe with an appropriate instrument of known efficiency. (Note - The use of dry material may not be appropriate for tritium.) When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area shall be based on the actual area and the entire surface shall be wiped. It is not necessary to use swiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.	Full	Ames Laboratory policies and procedures are consistent with this guidance. Ames Laboratory policies and procedures require a contamination survey of all accessible surfaces for those items upon removal from a posted contamination area. This is in addition to the direct scan survey required for all items being removed from a radiological or radioactive material area. Because of the nature of the radiation and radioactive material present on the Ames Laboratory site, direct scan surveys can be used to identify those items which may have removable surface contamination levels exceeding those specified in appendix D. Alternative methods are employed when the presence of tritium and/or removable activity is suspected.
Appendix D Footnote 5	This category of radionuclides includes mixed fission products, including the Sr-90 which is present in them. It does not apply to Sr-90 which has been separated from the other fission products or mixtures where the Sr-90 has been enriched.	N/A	This footnote is not applicable to Ames Laboratory as Ames Laboratory does not contain mixed fission products in its inventory of radionuclides.
Appendix D Footnote 6	Tritium contamination may diffuse into the volume or matrix of materials. Evaluation of surface contamination shall consider the extent to which such contamination may migrate to the surface in order to ensure the surface contamination value provided in this appendix is not exceeded. Once this contamination migrates to the surface, it may be removable, not fixed, therefore, a "Total" value does not apply.	Full	Ames Laboratory policies and procedures address this issue; when tritium contamination is suspected to be present at detectable levels, evaluation of surface contamination levels shall ensure removable surface contamination values in appendix D for tritium are not exceeded.
Appendix D Footnote 7	(alpha)	Full	Ames Laboratory's policies and procedures are consistant with this requirement. Ames Laboratory interprets this footnote to mean that those numerical values in the table portion of Appendix D denoted by footnote indicator "7" are the number of alpha disintegrations per minute per 100 cm^2.

REFERENCE	REQUIREMENT TEXT	STATUS	COMPLIANCE STATEMENT
Appendix E	The data presented in appendix E are to be used for identifying accountable sealed radioactive sources as defined at § 835.2(a), establishing the need for radioactive material area posting in accordance with § 835.603(g), and establishing the need for radioactive material labeling in accordance with § 835.605. NOTE: The data in the table are listed in alphabetical order by nuclide. Any alpha emitting radionuclide not listed in the table and mixtures of alpha emitters of unknown composition have a value of 10 microcuries. Any radionuclide other than alpha emitting radionuclides not listed above and mixtures of beta emitters of unknown composition have a value of 100 microcuries. Note: Where there is involved a combination of radionuclides in known amounts, derive the value for the combination as follows: determine, for each radionuclide in the combination, the ratio between the quantity present in the combination and the value otherwise established for the specific radionuclide when not in combination. If the sum of such ratios for all radionuclides in the combination exceeds unity (1), then the accountability criterion has been exceeded.	Full	Ames Laboratory policies and procedures are consistent with these requirements and data presented in appendix E.
1(a)	General. The rules in this part establish radiation protection standards, limits, and program requirements for protecting individuals from ionizing radiation resulting from the conduct of DOE activities.	Full	This statement summarizes the contents of the rules in this part and does not require any specific action on the part of Ames Laboratory.

REFERENCE	REQUIREMENT TEXT	STATUS	COMPLIANCE STATEMENT
1(b)	Exclusion. Except as directed in paragraph (c) of this section, the requirements in this part do not apply to: (1) Activities that are regulated through a license by the Nuclear Regulatory Commission or a State under an Agreement with the Nuclear Regulatory Commission, including activities certified by the Nuclear Regulatory Commission under section 1701 of the Atomic Energy Act; (2) Activities conducted under the authority of the Director, Naval Nuclear Propulsion Program, as described in Public Law 98-525; (3) Activities conducted under the Nuclear Explosives and Weapons Surety Program relating to the prevention of accidental or unauthorized nuclear detonations; (4) radioactive material transportation as defined in this part; (5) DOE activities conducted outside the United States on territory under the jurisdiction of a foreign government to the extent governed by occupational radiation protection requirements agreed to between the United States and the cognizant government; or (6) Background radiation, radiation doses received as a patient for the purposes of medical diagnosis or therapy, or radiation doses received from participation as a subject in medical research programs.	Full	Ames Laboratory acknowledges that the activities mentioned in § 835.1(b) are specifically excluded from the requirements of § 835 and commits to implementing the rules and regulations that govern such activities . Ames Laboratory policies and procedures include specific provisions to ensure that background radiation, radiation doses received as a patient for the purposes of medical diagnosis or therapy, or radiation doses received from participation as a subject in medical research programs are not included as part of our occupational radiation protection program.
1(c)	Occupational doses received as a result of excluded activities and radioactive material transportation, as listed in paragraphs (b)(1) through (b)(5) of this section, shall be considered when determining compliance with the occupational dose limits at §§ 835.202 and 835.207, and with the limits for the embryo/fetus at §835.206. Occupational doses resulting from authorized emergency exposures and planned special exposures shall not be considered when determining compliance with the dose limits at §§835.202 and 835.207.	Full	Ames Laboratory policies are consistent with these requirements.
2(a).01	Definitions. As used in this part: *Accountable sealed radioactive source* means a sealed radioactive source having a half-life equal to or greater than 30 days and an isotopic activity equal to or greater than the corresponding value provided in Appendix E of this part.	Full	Ames Laboratory has accepted the definition for accountable sealed radioactive source and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).02	*Airborne radioactive material or airborne radioactivity* means radioactive material dispersed in the air in the form of dusts, fumes, particulates, mists, vapors, or gases.	Full	Ames Laboratory has accepted the definition for airborne radioactive material or airborne radioactivity and has incorporated this definition into our plans, policies, and procedures, as appropriate.

REFERENCE	REQUIREMENT TEXT	STATUS	COMPLIANCE STATEMENT
2(a).03	*Airborne radioactivity area* means any area, accessible to individuals, where: (1) The concentration of airborne radioactivity, above natural background, exceeds or is likely to exceed the derived air concentration (DAC) values listed in appendix A or appendix C of this part; or (2) An individual present in the area without respiratory protection could receive an intake exceeding 12 DAC-hours in a week.	Full	Ames Laboratory has accepted the definition for airborne radioactivity area and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).04	*ALARA* means "As Low As is Reasonably Achievable," which is the approach to radiation protection to manage and control exposures (both individual and collective) to the work force and to the general public as low as is reasonable, taking into account social, technical, economic, practical, and public policy considerations. As used in this part, ALARA is not a dose limit but a process which has the objective of attaining doses as far below the applicable limits of this part as is reasonably achievable.	Full	Ames Laboratory has accepted the definition for ALARA and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).05	*Annual limit on intake (ALI)* means the derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by the reference man (ICRP Publication 23) that would result in a committed effective dose equivalent of 5 rems (0.05 sievert) or a committed dose equivalent of 50 rems (0.5 sievert) to any individual organ or tissue. ALI values for intake by ingestion and inhalation of selected radionuclides are bases on Table 1 of the U.S. Environmental Protection Agency's Federal Guidance Report No. 11, Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion, published September 1988. This document is available from the National Technical Information Service, Springfield, VA.	Full	Ames Laboratory has accepted the definition for annual limit on intake (ALI) and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).06	*Background* means radiation from: (i) Naturally occurring radioactive materials which have not been technologically enhanced; (ii) Cosmic sources; (iii) Global fallout as it exists in the environment (such as from the testing of nuclear explosive devices); (iv) Radon and its progeny in concentrations or levels existing in buildings or the environment which have not been elevated as a result of current or prior activities; and (v) Consumer products containing nominal amounts of radioactive material or producing nominal amounts of radiation.	Full	Ames Laboratory has accepted the definition for background and has incorporated this definition into our plans, policies, and procedures, as appropriate.

REFERENCE	REQUIREMENT TEXT	STATUS	COMPLIANCE STATEMENT
2(a).07	*Bioassay* means the determination of kinds, quantities, or concentrations, and, in some cases, locations of radioactive material in the human body, whether by direct measurement or by analysis and evaluation of radioactive materials excreted or removed from the human body.	Full	Ames Laboratory has accepted the definition for bioassay and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).08	*Calibration* means to adjust and/or determine either: (i) The response or reading of an instrument relative to a standard (e.g., primary, secondary, or tertiary) or to a series of conventionally true values; or (ii) The strength of a radiation source relative to a standard (e.g., primary, secondary, or tertiary) or conventionally true value.	Full	Ames Laboratory has accepted the definition for calibration and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).09	*Contamination area* means any area, accessible to individuals, where removable surface contamination levels exceed or are likely to exceed the removable surface contamination values specified in appendix D of this part, but do not exceed 100 times those values.	Full	Ames Laboratory has accepted the definition for contamination area and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).10	*Contractor* means any entity under contract with the Department of Energy with the responsibility to perform activities at a DOE site or facility.	Full	Ames Laboratory has accepted the definition for contractor and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).11	*Controlled area* means any area to which access is managed by or for DOE to protect individuals from exposure to radiation and/or radioactive material.	Full	Ames Laboratory has accepted the definition for controlled area and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).12	*Declared pregnant worker* means a woman who has voluntarily declared to her employer, in writing, her pregnancy for the purpose of being subject to the occupational dose limits to the embryo/fetus as provided in § 835.206. This declaration may be revoked, in writing, at any time by the declared pregnant worker.	Full	Ames Laboratory has accepted the definition for declared pregnant worker and has incorporated this definition into our plans, policies, and procedures, as appropriate.

2(a).13	*Derived air concentration (DAC)* means, for the radionuclides listed in appendix A of this part, the airborne concentration that equals the ALI divided by the volume of air breathed by an average worker for a working year of 2000 hours (assuming a breathing volume of 2400 m^3). For the radionuclides listed in appendix C of this part, the air immersion DACs were calculated for a continuous, non-shielded exposure via immersion in a semi-infinite atmospheric cloud. The value is based upon the derived airborne concentration found in Table 1 of the U.S. Environmental Protection Agency's Federal Guidance Report No. 11, Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion, published September 1988. This document is available from the National Technical Information Service, Springfield, VA.	Full	Ames Laboratory has accepted the definition for derived air concentration (DAC) and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).14	*Derived air concentration-hour (DAC-hour)* means the product of the concentration of radioactive material in air (expressed as a fraction or multiple of the DAC for each radionuclide) and the time of exposure to that radionuclide, in hours.	Full	Ames Laboratory has accepted the definition for derived air concentration-hour (DAC-hour) and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).15	*DOE activity* means an activity taken for or by DOE in a DOE operation or facility that has the potential to result in the occupational exposure of an individual to radiation or radioactive material. The activity may be, but is not limited to, design, construction, operation, or decommissioning. To the extent appropriate, the activity may involve a single DOE facility or operation or a combination of facilities and operations, possibly including an entire site or multiple DOE sites.	Full	Ames Laboratory has accepted the definition for DOE activity and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).16	*Entrance or access point* means any location through which an individual could gain access to areas controlled for the purpose of radiation protection. This includes entry or exit portals of sufficient size to permit human entry, irrespective of their intended use.	Full	Ames Laboratory has accepted the definition for entrance or access point and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).17	*General employee* means an individual who is either a DOE or DOE contractor employee; an employee of a subcontractor to a DOE contractor; or an individual who performs work for or in conjunction with DOE or utilizes DOE facilities.	Full	Ames Laboratory has accepted the definition for general employee and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).18	*High contamination area* means any area, accessible to individuals, where removable surface contamination levels exceed or are likely to exceed 100 times the removable surface contamination values specified in appendix D of this part.	Full	Ames Laboratory has accepted the definition for high contamination area and has incorporated this definition into our plans, policies, and procedures, as appropriate.

2(a).19	*High radiation area* means any area, accessible to individuals, in which radiation levels could result in an individual receiving a deep dose equivalent in excess of 0.1 rem (0.001 sievert) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.	Full	Ames Laboratory has accepted the definition for high radiation area and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).20	*Individual* means any human being.	Full	Ames Laboratory has accepted the definition for individual and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).21	*Member of the public* means an individual who is not a general employee. An individual is not a "member of the public" during any period in which the individual receives an occupational dose.	Full	Ames Laboratory has accepted the definition for member of the public and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).22	*Minor* means an individual less than 18 years of age.	Full	Ames Laboratory has accepted the definition for minor and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).23	*Monitoring* means the measurement of radiation levels, airborne radioactivity concentrations, radioactive contamination levels, quantities of radioactive material, or individual doses and the use of the results of these measurements to evaluate radiological hazards or potential and actual doses resulting from exposures to ionizing radiation.	Full	Ames Laboratory has accepted the definition for monitoring and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).24	*Nonstochastic effects* means effects due to radiation exposure for which the severity varies with the dose and for which a threshold normally exists (e.g., radiation-induced opacities within the lens of the eye).	Full	Ames Laboratory has accepted the definition for nonstochastic effects and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).25	*Occupational dose* means an individual's ionizing radiation dose (external and internal) as a result of that individual's work assignment. Occupational dose does not include doses received as a medical patient or doses resulting from background radiation or participation as a subject in medical research programs.	Full	Ames Laboratory has accepted the definition for occupational dose and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).26	*Person* means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency, any State or political subdivision of, or any political entity within a State, any foreign government or nation or other entity, and any legal successor, representative, agent or agency of the foregoing; provided that person does not include the Department or the United States Nuclear Regulatory Commission.	Full	Ames Laboratory has accepted the definition for person and has incorporated this definition into our plans, policies, and procedures, as appropriate.

2(a).27	*Radiation* means ionizing radiation: alpha particles, beta particles, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. Radiation, as used in this part, does not include non-ionizing radiation, such as radio- or micro-waves, or visible, infrared, or ultraviolet light.	Full	Ames Laboratory has accepted the definition for radiation and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).28	*Radiation area* means any area, accessible to individuals, in which radiation levels could result in an individual receiving a deep dose equivalent in excess of 0.005 rem (0.05 millisievert) in 1 hour at 30 centimeters from the source or from any surface that the radiation penetrates.	Full	Ames Laboratory has accepted the definition for radiation area and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).29	*Radioactive material area* means any area within a controlled area, accessible to individuals, in which items or containers of radioactive material exist and the total activity of radioactive material exceeds the applicable values provided in appendix E of this part.	Full	Ames Laboratory has accepted the definition for radioactive material area and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).30	*Radioactive material transportation* means the movement of radioactive material by aircraft, rail, vessel, or highway vehicle when such movement is subject to Department of Transportation regulations or DOE Orders that govern such movements. Radioactive material transportation does not include preparation of material or packagings for transportation, monitoring required by this part, storage of material awaiting transportation or application of markings and labels required for transportation.	Full	Ames Laboratory has accepted the definition for radioactive material transportation and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).31	*Radiological area* means any area within a controlled area defined in this section as a “radiation area,” “high radiation area,” “very high radiation area,” “contamination area,” “high contamination area,” or “airborne radioactivity area.”	Full	Ames Laboratory has accepted the definition for radiological area and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).32	*Radiological worker* means a general employee whose job assignment involves operation of radiation producing devices or working with radioactive materials, or who is likely to be routinely occupationally exposed above 0.1 rem (0.001 sievert) per year total effective dose equivalent.	Full	Ames Laboratory has accepted the definition for radiological worker and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).33	*Real-time air monitoring* means measurement of the concentrations or quantities of airborne radioactive materials on a continuous basis.	Full	Ames Laboratory has accepted the definition for real-time air monitoring and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).34	*Respiratory protective device* means an apparatus, such as a respirator, worn by an individual for the purpose of reducing the individual’s intake of airborne radioactive materials.	Full	Ames Laboratory has accepted the definition for respiratory protective device and has incorporated this definition into our plans, policies, and procedures, as appropriate.

2(a).35	*Sealed radioactive source* means a radioactive source manufactured, obtained, or retained for the purpose of utilizing the emitted radiation. The sealed radioactive source consists of a known or estimated quantity of radioactive material contained within a sealed capsule, sealed between layer(s) of non-radioactive material, or firmly fixed to a non-radioactive surface by electroplating or other means intended to prevent leakage or escape of the radioactive material. Sealed radioactive sources do not include reactor fuel elements, nuclear explosive devices, and radioisotope thermoelectric generators.	Full	Ames Laboratory has accepted the definition for sealed radioactive source and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).36	*Source leak test* means a test to determine if a sealed radioactive source is leaking radioactive material.	Full	Ames Laboratory has accepted the definition for source leak test and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).37	*Stochastic effects* means malignant and hereditary diseases for which the probability of an effect occurring, rather than its severity, is regarded as a function of dose without a threshold, for radiation protection purposes.	Full	Ames Laboratory has accepted the definition for stochastic effects and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).38	*Very high radiation area* means any area accessible to individuals in which radiation levels could result in an individual receiving an absorbed dose in excess of 500 rads (5 grays) in one hour at 1 meter from a radiation source or from any surface that the radiation penetrates.	Full	Ames Laboratory has accepted the definition for very high radiation area and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).39	*Week* means a period of seven consecutive days.	Full	Ames Laboratory has accepted the definition for week and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(a).40	*Year* means the period of time beginning on or near January 1 and ending on or near December 31 of that same year used to determine compliance with the provisions of this part. The starting and ending date of the year used to determine compliance may be changed provided that the change is made at the beginning of the year and that no day is omitted or duplicated in consecutive years.	Full	Ames Laboratory has accepted the definition for year and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).01	As used in this part to describe various aspects of radiation dose: *Absorbed dose (D)* means the energy absorbed by matter from ionizing radiation per unit mass of irradiated material at the place of interest in that material. The absorbed dose is expressed in units of rad (or gray) (1 rad = 0.01 gray).	Full	Ames Laboratory has accepted the definition for absorbed dose (D) and has incorporated this definition into our plans, policies, and procedures, as appropriate.

2(b).02	*Committed dose equivalent ($H_{T,50}$)* means the dose equivalent calculated to be received by a tissue or organ over a 50-year period after the intake of a radionuclide into the body. It dose not include contributions from radiation sources external to the body. Committed dose equivalent is expressed in units of rem (or sievert) (1 rem = 0.01 sievert).	Full	Ames Laboratory has accepted the definition for committed dose equivalent ($H_{T,50}$) and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).03	*Committed effective dose equivalent ($H_{E,50}$)* means the sum of the committed dose equivalents to various tissues in the body ($H_{T,50}$), each multiplied by the appropriate weighting factor (w_T) – that is, $H_{E,50} = \sum w_T H_{T,50}$. Committed effective dose equivalent is expressed in units of rem (or sievert).	Full	Ames Laboratory has accepted the definition for committed effective dose equivalent ($H_{E,50}$) and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).04	*Cumulative total effective dose equivalent* means the sum of all total effective dose equivalent values recorded for an individual, where available, for each year occupational dose was received, beginning January 1, 1989.	Full	Ames Laboratory has accepted the definition for cumulative total effective dose equivalent and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).05	*Deep dose equivalent* means the dose equivalent derived from external radiation at a depth of 1 cm in tissue.	Full	Ames Laboratory has accepted the definition for deep dose equivalent and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).06	*Dose* is a general term for absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, or total effective dose equivalent as defined in this part.	Full	Ames Laboratory has accepted the definition for dose and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).07	*Dose equivalent (H)* means the product of absorbed dose (D) in rad (or gray) in tissue, a quality factor (Q), and other modifying factors (N). Dose equivalent is expressed in units of rem (or sievert) (1 rem = 0.01 sievert).	Full	Ames Laboratory has accepted the definition for dose equivalent (H) and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).08	*Effective dose equivalent (H_E)* means the summation of the products of the dose equivalent received by specified tissues of the body (H_T) and the appropriate weighting factor (w_T) – that is, $H_E = \sum w_T H_T$. It includes the dose from radiation sources internal and/or external to the body. For purposes of compliance with this part, deep dose equivalent to the whole body may be used as effective dose equivalent for external exposures. The effective dose equivalent is expressed in units of rem (or sievert).	Full	Ames Laboratory has accepted the definition for effective dose equivalent (H_E) and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).09	*External dose or exposure* means that portion of the dose equivalent received from radiation sources outside the body (i.e., "external sources").	Full	Ames Laboratory has accepted the definition for external dose or exposure and has incorporated this definition into our plans, policies, and procedures, as appropriate.

2(b).10	*Extremity* means hands and arms below the elbow or feet and legs below the knee.	Full	Ames Laboratory has accepted the definition for extremity and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).11	*Internal dose or exposure* means that portion of the dose equivalent received from radioactive material taken into the body (i.e., "internal sources").	Full	Ames Laboratory has accepted the definition for internal dose or exposure and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).12	*Lens of the eye dose equivalent* means the external exposure of the lens of the eye and is taken as the dose equivalent at a tissue depth of 0.3 cm.	Full	Ames Laboratory has accepted the definition for lens of eye dose equivalent and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).13	*Quality factor (Q)* means the modifying factor used to calculate the dose equivalent from the absorbed dose; the absorbed dose (expressed in rad or gray) is multiplied by the appropriate quality factor. (i) The quality factors to be used for determining dose equivalent in rem are as follows: [QF Table contained in § 835.2(b)(i)] When spectral data are insufficient to identify the energy of the neutrons, a quality factor of 10 shall be used. (ii) When spectral data are sufficient to identify the energy of the neutrons, the following mean quality factors may be used: QUALITY ~~F~~ACTORS FOR NEUTRONS [Mean quality factors, Q (maximum value in a 30-cm dosimetry phantom), and values of neutron flux density that deliver in 40 hours, a maximum dose equivalent of 0.1 rem (0.001 sievert). Where neutron energy falls between listed values, the more restrictive mean quality factor shall be used.] [QF for Neutrons Table in § 835.2(b)(ii)]	Full	Mean quality factors, Q (maximum value in a 30-cm phantom), and/or values of neutron flux density that deliver in 40 hrs, a maximum dose equivalent of 0.1 rem (0.001 sievert) as tabulated in § 835.2(b) are used to calculate dose equivalent. Where the neutron energy falls between listed values, the more restrictive mean quality factor shall be used.
2(b).14	*Shallow dose equivalent* means the dose equivalent deriving from external radiation at a depth of 0.007 cm in tissue.	Full	Ames Laboratory has accepted the definition for shallow dose equivalent and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).15	*Total effective dose equivalent (TEDE)* means the sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).	Full	Ames Laboratory has accepted the definition for total effective dose equivalent (TEDE) and has incorporated this definition into our plans, policies, and procedures, as appropriate.

2(b).16	*Weighting* factor (w_T) means the fraction of the overall health risk, resulting from uniform, whole body irradiation, attributable to specific tissue (T). The dose equivalent to tissue, (H_T), is multiplied by the appropriate weighting factor to obtain the effective dose equivalent contribution from that tissue. The weighting factors are as follows: [Weighting Factors in § 835.2(b)(ii)] [1]"Remainder" means the five other organs or tissues, excluding the skin and lens of the eye, with the highest dose (e.g., liver, kidney, spleen, thymus, adrenal, pancreas, stomach, small intestine, and upper large intestine). The weighting factor each remaining organ or tissue is 0.06. [2]For the case of uniform external irradiation of the whole body, a weighting factor (w_T) equal to 1 may be used in determination of the effective dose equivalent.	Full	Ames Laboratory has accepted the definition for weighting factor (w_T) and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(b).17	*Whole body* means, for the purposes of external exposure, head, trunk (including male gonads), arms above and including the elbow, or legs above and including the knee.	Full	Ames Laboratory has accepted the definition for whole body and has incorporated this definition into our plans, policies, and procedures, as appropriate.
2(c)	Terms defined in the Atomic Energy Act and not defined in this part are used consistent with the meanings given in the Act.	Full	Terms defined in the Atomic Energy Act and not defined within the text of § 835 are used in a manner consistent with the meanings given in the Act.
3(a)	No person or DOE personnel shall take or cause to be taken any action inconsistent with the requirements of: (1) This part; or (2) Any program, plan, schedule, or other process established by this part.	Full	Ames Laboratory policies are consistent with this requirement by prohibiting any person or DOE personnel from willfully taking or causing to be taken any action inconsistent with the requirements of § 835 or any program, plan, schedule, or other process established by § 835.
3(b)	With respect to a particular DOE activity, contractor management shall be responsible for compliance with the requirements of this part.	Full	Ames Laboratory policies are consistent with this requirement.
3(c)	Where there is no contractor for a DOE activity, DOE shall ensure implementation of and compliance with the requirements of this part.	NA	DOE is responsible to ensure that this requirement is met for DOE activities not associated with a contractor.
3(d)	Nothing in this part shall be construed as limiting actions that may be necessary to protect health and safety.	Full	Ames Laboratory policies are consistent with this requirement.
3(e)	For those activities that are required by §§835.102, 835.901(e), 835.1202(a), and 835.1202(b), the time interval to conduct these activities may be extended by a period not to exceed 30 days to accommodate scheduling needs.	Full	Ames Laboratory policies are consistent with this statement and allow a grace period not to exceed 30 days to accommodate scheduling needs.

4	Unless otherwise specified, the quantities used in the records required by this part shall be clearly indicated in special units of curie, rad, roentgen, or rem, including multiples and subdivisions of these units. The SI units, becquerel (Bq), gray (Gy), and sievert (Sv), are only provided parenthetically in this part for reference with scientific standards.	Full	Ames Laboratory policies and procedures are consistent with this requirement and specify that the quantities used in the records required by § 835 shall be clearly indicated in the special units of curie, rad, roentgen, or rem, including multiples and subdivisions of these units.
101(a)	A DOE activity shall be conducted in compliance with a documented radiation protection program (RPP) as approved by the DOE.	Full	Ames Laboratory policies are consistent with this requirement, requiring that all radiological activities be conducted in compliance with a documented radiation protection program (RPP) approved by DOE.
101(b)	The DOE may direct or make modifications to a RPP.	Full	DOE is responsible for implementing this option.
101(c)	The content of each RPP shall be commensurate with the nature of the activities performed and shall include formal plans and measures for applying the as low as reasonably achievable (ALARA) process to occupational exposure.	Full	Ames Laboratory policies are consistent with this requirement. The content of the RPP has been reviewed in the context of the scope of operations at the Ames Laboratory as submitted with the RPP (see 3.0 Scope of Radiological Operations) and an ALARA statement is included (see 4.0 ALARA Statement).
101(d)	The RPP shall specify the existing and/or anticipated operational tasks that are intended to be within the scope of the RPP. Except as provided in § 835.101(h), any task outside the scope of a RPP shall not be initiated until an update of the RPP is approved by DOE.	Full	Ames Laboratory has, to the best of its knowledge and belief, specified all the existing and/or anticipated operational tasks that are intended to be within the scope of the RPP (See 3.0 Scope of Radiological Operations.) Any task outside the scope of the RPP shall not be initiated until an update of the RPP is approved by DOE unless the changes, additions, or updates to the RPP do not decrease the effectiveness of the RPP.
101(e)	The content of the RPP shall address, but shall not necessarily be limited to, each requirement in this part.	Full	This RPP addresses each requirement as stated in § 835.

101(f)	The RPP shall include plans, schedules, and other measures for achieving compliance with regulations of this part. Unless otherwise specified in this part, compliance with amendments to this part shall be achieved no later than 180 days following approval of the revised RPP by DOE. Compliance with the requirements of §835.402(d) for radiobioassay program accreditation shall be achieved no later than January 1, 2002.	Full	Where applicable, the RPP submitted by Ames Laboratory includes measures for achieving compliance with the regulations of § 835. Compliance with the requirements of § 835 shall be achieved for those requirements deemed applicable to Ames Laboratory for which there is no approved exemption request within 180 days following the approval of any revision to the Ames Laboratory RPP. The requirements of §835.402(d) for radiobioassay program accreditation are not applicable to Ames Laboratory for the reasons outlined later in this document. Future activities not addressed in the initial scope of the RPP shall be evaluated against the requirements of § 835 and compliance shall be achieved prior to the initiation of the work
101(g)	An update of the RPP shall be submitted to DOE: (1) Whenever a change or an addition to the RPP is made; (2) Prior to the initiation of a task not within the scope of the RPP; or (3) Within 180 days of the effective date of any modifications to this part.	Full	An update of the RPP shall be submitted to DOE: whenever a change or an addition to the RPP is made; prior to the initiation of a task not within the scope of the RPP; or within 180 days of the effective date of any modifications to § 835.
101(h)	Changes, additions, or updates to the RPP may become effective without prior Department approval only if the changes do not decrease the effectiveness of the RPP and the RPP, as changed, continues to meet the requirements of this part. Proposed changes that decrease the effectiveness of the RPP shall not be implemented without submittal to and approval by the Department.	Full	Changes, additions, or updates to the RPP may become effective without prior DOE approval only if the changes do not decrease the effectiveness of the RPP, and the RPP, as changed, continues to meet the requirements of § 835. Proposed changes that decrease the effectiveness of the RPP will not be implemented without submittal to and approval by the DOE.
101(i)	An initial RPP or an update shall be considered approved 180 days after its submission unless rejected by DOE at an earlier date.	Full	Ames Laboratory will consider an initial RPP or an update to be approved 180 days after its submission unless rejected by DOE at an earlier date.

102	Internal audits of the radiation protection program, including examination of program content and implementation, shall be conducted through a process that ensures that all functional elements are reviewed no less frequently than every 36 months.	Full	Ames Laboratory policies and procedures are consistent with this requirement. Internal audits of all functional elements of the radiation protection program shall be conducted no less frequently than every 36 months and shall include program content and implementation. Provisions have been made for a grace period of up to 30 days to accommodate the operational schedule as allowed by § 835.3(e).
103	Individuals responsible for developing and implementing measures necessary for ensuring compliance with the requirements of this part shall have the appropriate education, training, and skills to discharge these responsibilities.	Full	Ames Laboratory policies and procedures are consistent with this requirement.
104	Written procedures shall be developed and implemented as necessary to ensure compliance with this part, commensurate with the radiological hazards created by the activity and consistent with the education, training and skills of the individuals exposed to those hazards.	Full	Written procedures have been developed and implemented as necessary to ensure compliance with § 835.
202(a)(1)	Except for planned special exposures conducted consistent with § 835.204 and emergency exposures authorized in accordance with § 835.1302, the occupational dose received by general employees shall be controlled such that the following limits are not exceeded in a year: A total effective dose equivalent of 5 rems (0.05 sievert);	Full	Occupational exposure to general employees resulting from DOE activities, other than authorized emergency exposures, is controlled through monitoring, administrative goals, pre-job planning, physical design features, and other administrative controls, so that a total effective dose equivalent of 5 rems/year is not exceeded.
202(a)(2)	Except for planned special exposures conducted consistent with § 835.204 and emergency exposures authorized in accordance with § 835.1302, the occupational dose received by general employees shall be controlled such that the following limits are not exceeded in a year: The sum of the deep dose equivalent for external exposures and the committed dose equivalent to any organ or tissue other than the lens of the eye of 50 rems (0.5 sievert).	Full	Occupational exposure to general employees resulting from DOE activities, other than authorized emergency exposures, is controlled through monitoring, pre-job planning, physical design features, and other administrative controls, so the sum of the deep dose equivalent for external exposures and the committed dose equivalent to any organ or tissues other than the lens of the eye of 50 rems/year is not exceeded.

202(a)(3)	Except for planned special exposures conducted consistent with § 835.204 and emergency exposures authorized in accordance with § 835.1302, the occupational dose received by general employees shall be controlled such that the following limits are not exceeded in a year: A lens of the eye dose equivalent of 15 rems (0.15 sievert); and	Full	Ames Laboratory does not routinely monitor specifically for dose to the lens of the eye due to the physical characteristics of radiation fields present. In the absence of specific monitoring, the dose equivalent to the lens of the eye is taken to be equal to the dose equivalent at a tissue depth of 300 mg/cm^2. With this, occupational exposure to general employees resulting from DOE activities, other than authorized emergency exposures, is controlled through monitoring, pre-job planning, physical design features, and other administrative controls, so that a lens of the eye dose equivalent of 15 rems/year is not exceeded.
202(a)(4)	Except for planned special exposures conducted consistent with § 835.204 and emergency exposures authorized in accordance with § 835.1302, the occupational dose received by general employees shall be controlled such that the following limits are not exceeded in a year: A shallow dose equivalent of 50 rems (0.5 sievert) to the skin or to any extremity.	Full	Occupational exposure to general employees resulting from DOE activities, other than authorized emergency exposures and non-uniform exposure of the skin less than 10 cm^2, is controlled through monitoring, pre-job planning, physical design features, and other administrative controls so that a shallow dose equivalent of 50 rems/year to the skin or any extremity is not exceeded.
202(b)	All occupational doses received during the current year, except doses resulting from planned special exposures conducted in compliance with § 835.204 and emergency exposures authorized in accordance with § 835.1302, shall be included when demonstrating compliance with §§ 835.202(a) and 835.207.	Full	When determining that the limits specified in § 835.202(a) and 207 are not exceeded, all reported occupational exposure, with the notable exceptions of authorized emergency exposures [§ 835.1302], and the non-uniform irradiation of the skin less than 10 cm^2 [§ 835.205(b)(3)], received during the current calendar year shall be included.
202(c)	Doses from background, therapeutic and diagnostic medical radiation, and participation as a subject in medical research programs shall not be included in dose records or in the assessment of compliance with the occupational dose limits.	Full	Data on nonoccupational exposures are not collected, stored or reported by Ames Laboratory.
203(a)	The total effective dose equivalent during a year shall be determined by summing the effective dose equivalent from external exposures and the committed effective dose equivalent from intakes during the year.	Full	The sum of the effective dose equivalent from external exposures and the committed effective dose equivalent from intakes during the year is taken to be the total effective dose equivalent.

203(b)	Determinations of the effective dose equivalent shall be made using the weighting factor values provided in § 835.2.	Full	Ames Laboratory policies and procedures are consistent with this requirement and determinations of the effective dose equivalent shall be made using the weighting values provided in § 835.2.
204(a)(1)	A planned special exposure may be authorized for a radiological worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in § 835.202(a), provided that each of the following conditions is satisfied: The planned special exposure is considered only in an exceptional situation when alternatives that might prevent a radiological worker from exceeding the limits in § 835.202(a) are unavailable or impractical;	NA	Ames Laboratory will not use planned special exposures (PSEs).
204(a)(2)	A planned special exposure may be authorized for a radiological worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in § 835.202(a), provided that each of the following conditions is satisfied: The contractor management (and employer, if the employer is not the contractor) specifically requests the planned special exposure, in writing; and	NA	Ames Laboratory will not use PSEs.
204(a)(3)	A planned special exposure may be authorized for a radiological worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in § 835.202(a), provided that each of the following conditions is satisfied: Joint written approval is received from the appropriate DOE Headquarters program office and the Secretarial Officer responsible for environment, safety and health matters.	NA	Ames Laboratory will not use PSEs.
204(b)	Prior to requesting an individual to participate in an authorized planned special exposure, the individual's dose from all previous planned special exposures and all doses in excess of the occupational dose limits shall be determined.	NA	Ames Laboratory will not use PSEs.
204(c)	An individual shall not receive a planned special exposure that, in addition to the doses determined in § 835.204(b), would result in a dose exceeding the following: (1) In a year, the numerical values of the dose limits established at § 835.202(a); and (2) Over the individual's lifetime, five times the numerical values of the dose limits established at § 835.202(a).	NA	Ames Laboratory will not use PSEs.

204(d)	Prior to a planned special exposure, written consent shall be obtained from each individual involved. Each such consent shall include: (1) The purpose of the planned operations and procedures to be used; (2) The estimated doses and associated potential risks and specific radiological conditions and other hazards which might be involved in performing the task; and (3) Instructions on the measures to be taken to keep the dose ALARA considering other risks that may be present.	NA	Ames Laboratory will not use PSEs.

204(e)	Records of the conduct of a planned special exposure shall be maintained and a written report submitted within 30 days after the planned special exposure to the approving organizations identified in § 835.204(a)(3).	NA	Ames Laboratory will not use PSEs.
204(f)	The dose from planned special exposures is not to be considered in controlling future occupational dose of the individual under § 835.202(a), but is to be included in records and reports required under this part.	NA	Ames Laboratory will not use PSEs.
205(a)	Non-uniform exposures of the skin from X-rays, beta radiation, and/or radioactive material on the skin are to be assessed as specified in this section.	Full	See responses to § 835.205(b)(1), § 835.205(b)(2), and § 835.205(b)(3).
205(b)(1)	For purposes of demonstrating compliance with § 835.202(a)(4), assessments shall be conducted as follows: Area of skin irradiated is 100 cm^2 or more. The non-uniform dose equivalent received during the year shall be averaged over the 100 cm^2 of the skin receiving the maximum dose, added to any uniform dose equivalent also received by the skin, and recorded as the shallow dose equivalent to any extremity or skin for the year.	Full	Ames Laboratory policies and procedures are consistent with this requirement.
205(b)(2)	For purposes of demonstrating compliance with § 835.202(a)(4), assessments shall be conducted as follows: Area of skin irradiated is 10 cm^2 or more, but is less than 100 cm^2. The non-uniform dose equivalent (H) to the irradiated area received during the year shall be added to any uniform dose equivalent also received by the skin and recorded as the shallow dose equivalent to any extremity or skin for the year. H is the dose equivalent averaged over the 1 cm^2 of skin receiving the maximum absorbed dose, D, reduced by the fraction f, which is the irradiated area in cm^2 divided by 100 cm^2 (i.e., H=fD). In no case shall a value of f less than 0.1 be used.	Full	Ames Laboratory policies and procedures are consistent with this requirement.
205(b)(3)	For purposes of demonstrating compliance with § 835.202(a)(4), assessments shall be conducted as follows: Area of skin irradiated is less than 10 cm^2. The non-uniform dose equivalent shall be averaged over the 1 cm^2 of skin receiving the maximum dose. This dose equivalent shall: (i) Be recorded in the individual's occupational exposure history as a special entry; and (ii) Not be added to any other shallow dose equivalent to any extremity or skin recorded as the dose equivalent for the year.	Full	Ames Laboratory policies and procedures are consistent with this requirement.
206(a)	The dose equivalent limit for the embryo/fetus from the period of conception to birth, as a result of occupational exposure of a declared pregnant worker, is 0.5 rem (0.005 sievert).	Full	Ames Laboratory policies are consistent with this requirement.

206(b)	Substantial variation above a uniform exposure rate that would satisfy the limits provided in § 835.206(a) shall be avoided.	Full	Ames Laboratory policies are consistent with this requirement.
206(c)	If the dose equivalent to the embryo/fetus is determined to have already exceeded 0.5 rem (0.005 sievert) by the time a worker declares her pregnancy, the declared pregnant worker shall not be assigned to tasks where additional occupational exposure is likely during the remaining gestation period.	Full	Ames Laboratory policies are consistent with this requirement.
207	The dose equivalent limits for minors occupationally exposed to radiation and/or radioactive materials at a DOE activity are 0.1 rem (0.001 sievert) total effective dose equivalent in a year and 10% of the occupational dose limits specified at § 835.202(a)(3) and (a)(4).	Full	Ames Laboratory policies are consistent with this requirement.
208	The total effective dose equivalent for members of the public exposed to radiation and/or radioactive material during access to a controlled area is 0.1 rem (0.001 sievert) in a year.	Full	Ames Laboratory policies are consistent with this requirement.
209(a)	The derived air concentration (DAC) values given in appendices A and C of this part shall be used in the control of occupational exposures to airborne radioactive material.	Full	Ames Laboratory policies are consistent with this requirement.
209(b)	The estimation of internal dose shall be based on bioassay data rather than air concentration values unless bioassay data are: (1) unavailable; (2) inadequate; or (3) internal dose estimates based on air concentration values are demonstrated to be as or more accurate.	Full	Ames Laboratory policies are consistent with this requirement.
401(a)	Monitoring of individuals and areas shall be performed to: (1) Demonstrate compliance with the regulations in this part; (2) Document radiological conditions; (3) Detect changes in radiological conditions; (4) Detect the gradual buildup of radioactive material; (5) Verify the effectiveness of engineering and process controls in containing radioactive material and reducing radiation exposure; and (6) Identify and control potential sources of individual exposure to radiation and/or radioactive material.	Full	Ames Laboratory policies and procedures are consistent with this requirement
401(b)	Instruments and equipment used for monitoring shall be: (1) Periodically maintained and calibrated on an established frequency; (2) Appropriate for the type(s), levels, and energies of the radiation(s) encountered; (3) Appropriate for existing environmental conditions; and (4) Routinely tested for operability.	Full	Ames Laboratory policies and procedures are consistent with these requirements.

402(a)	For the purpose of monitoring individual exposures to external radiation, personnel dosimeters shall be provided to and used by: (1) Radiological workers who, under typical conditions, are likely to receive one or more of the following: (i) An effective dose equivalent to the whole body of 0.1 rem (0.001 sievert) or more in a year; (ii) a shallow dose equivalent to the skin or to any extremity of 5 rems (0.05 sievert) or more in a year; (iii) a lens of the eye dose equivalent of 1.5 rems (0.015 sievert) or more in a year; (2) Declared pregnant workers who are likely to receive from external sources a dose equivalent to the embryo/fetus in excess of 10 percent of the applicable limit in § 835.206(a); (3) Occupationally exposed minors likely to receive a dose in excess of 50% of the applicable limits at § 835.207 in a year from external sources; (4) Members of the public entering a controlled area likely to receive a dose in excess of 50 percent of the limit at § 835.208 in a year from external sources; and (5) Individuals entering a high or very high radiation area.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
402(b)	External dose monitoring programs implemented to demonstrate compliance with § 835.402(a) shall be adequate to demonstrate compliance with the dose limits established in subpart C of this part and shall be: (1) Accredited, or excepted from accreditation, in accordance with the DOE Laboratory Accreditation Program for Personnel Dosimetry; or (2) Determined by the Secretarial Officer responsible for environment, safety and health matters to have performance substantially equivalent to that of programs accredited under the DOE Laboratory Accreditation Program for Personnel Dosimetry.	Full	The external dose monitoring program at Ames Laboratory is adequate to demonstrate compliance with the dose limits established in subpart C based on the dosimetry provider's accreditation with the National Voluntary Laboratory Accreditation Program for Personnel Dosimetry. Ames Laboratory is not required to have DOELAP accreditation, since it has been given an exception from DOE, which is on file.

402(c)(1)-(4)	For the purpose of monitoring individual exposures to internal radiation, internal dosimetry programs (including routine bioassay programs) shall be conducted for: (1) Radiological workers who, under typical conditions, are likely to receive a committed effective dose equivalent of 0.1 rem (0.001 sievert) or more from all occupational radionuclide intakes in a year; (2) Declared pregnant workers likely to receive an intake or intakes resulting in a dose equivalent to the embryo/fetus in excess of 10 percent of the limit stated in § 835.206(a); (3) Occupationally exposed minors who are likely to receive a dose in excess of 50 percent of the applicable limit stated in § 835.207 from all radionuclide intakes in a year; or (4) Members of the public entering a controlled area likely to receive a dose in excess of 50 percent of the limit stated in § 835.208 from all radionuclide intakes in a year.	NA	Ames Laboratory policy addresses this requirement. There are: (1) No radiological workers who, under typical conditions, are likely to receive a committed effective dose equivalent of 0.1 rem or more from all occupational radionuclide intakes in a year; (2) No declared pregnant workers likely to receive an intake or intakes resulting in a dose equivalent to the embryo/fetus in excess of 10 percent of the stated limit in § 835.206; (3) No occupationally exposed minors who are likely to receive a dose in excess of 50 percent of the applicable limit at § 835.207 from all radionuclide intakes in a year; and (4) No members of the public entering a controlled area who are likely to receive a dose in excess of 50 percent of the limits stated at § 835.208 from all radionuclide intakes in a year. Should the scope of activities be modified such that routine monitoring of individual exposures to internal radiation is necessary, Ames Laboratory will revise its internal dose evaluation program to ensure that the dose equivalent limits established in subpart C of this part are not exceeded. Ames Laboratory's internal dose evaluation program provides for discretionary monitoring on a case-by-case basis to address special circumstances and accidental or emergency exposures. Under these circumstances, bioassay and/or whole body counting services will be obtained from an accredited provider.
402(d)	Internal dose monitoring programs implemented to demonstrate compliance with § 835.402(c) shall be adequate to demonstrate compliance with the dose limits established in subpart C of this part and shall be: (1) Accredited, or excepted from accreditation, in accordance with the DOE Laboratory Accreditation Program for Radiobioassay; or (2) Determined by the Secretarial Officer responsible for environment, safety, and health matters to have performance substantially equivalent to that of programs accredited under the DOE Laboratory Accreditation Program for Radiobioassay.	NA	See response to § 835.402(c)(1)-(4).

403	(a) Monitoring of airborne radioactivity shall be performed: (1) Where an individual is likely to receive an exposure of 40 or more DAC-hours in a year; or (2) as necessary to characterize the airborne radioactivity hazard where respiratory protective devices for protection against airborne radionuclides have been prescribed. (b) Real-time air monitoring shall be performed as necessary to detect and provide warning of airborne radioactivity concentrations that warrant immediate action to terminate inhalation of airborne radioactive material.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
405(a)	If packages containing quantities of radioactive material in excess of a Type A quantity (as defined at 10 CFR 71.4) are expected to be received from radioactive material transportation, arrangements shall be made to either: (1) Take possession of the package when the carrier offers it for delivery; or (2) Receive notification as soon as practicable after arrival of the package at the carrier's terminal and to take possession of the package expeditiously after receiving such notification.	Full	When notified that packages containing quantities of radioactive material in excess of a Type A quantity (as defined at 10 CFR 71.4) are to be received from radioactive material transportation, arrangements will be made to take possession of the package when the carrier offers it for delivery.
405(b)	Upon receipt from radioactive material transportation, external surfaces of packages known to contain radioactive material shall be monitored if the package: (1) Is labeled with a Radioactive White I, Yellow II, or Yellow III label (as specified at 49 CFR 172.403 and 172.436-440); or (2) Has been transported as low specific activity material (as defined at 10 CFR 71.4) on an exclusive use vehicle (as defined at 10 CFR 71.4); or (3) Has evidence of degradation, such as packages that are crushed, wet, or damaged.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
405(c)	The monitoring required by paragraph (b) of this section shall include: (1) Measurements of removable contamination levels, unless the package contains only special form (as defined at 10 CFR 71.4) or gaseous radioactive material; and (2) Measurements of the radiation levels, unless the package contains less than a Type A quantity (as defined at 10 CFR 71.4) of radioactive material.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
405(d)	The monitoring required by paragraph (b) of this section shall be completed as soon as practicable following receipt of the package, but not later than 8 hours after the beginning of the working day following receipt of the package.	Full	Ames Laboratory policies and procedures are consistent with these requirements.

501	(a) Personnel entry control shall be maintained for each radiological area. (b) The degree of control shall be commensurate with existing and potential radiological hazards within the area. (c) One or more of the following methods shall be used to ensure control: (1) Signs and barricades; (2) Control devices on entrances; (3) Conspicuous visual and/or audible alarms; (4) Locked entrance ways; or (5) Administrative controls. (d) Written authorizations shall be required to control entry into and perform work within radiological areas. These authorizations shall specify radiation protection measures commensurate with the existing and potential hazards. (e) No control(s) shall be installed at any radiological area exit that would prevent rapid evacuation of personnel under emergency conditions.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
502(a)	The following measures shall be implemented for each entry into a high radiation area: (1) The area shall be monitored as necessary during access to determine the exposure rates to which the individuals are exposed; and (2) Each individual shall be monitored by a supplemental dosimetry device or other means capable of providing an immediate estimate of the individual's integrated deep dose equivalent during the entry.	Full	The exposure rates to which individuals are exposed have been determined prior to access or assessed during the initial entry. If rates are expected to change, additional monitoring may be imposed. Each individual entering a high radiation area is monitored by a supplemental dosimetry device or other means capable of providing an immediate estimate of the individual's integrated deep dose equivalent during the entry.

502(b)	Physical controls. One or more of the following controls shall be used for each entrance or access point to a high radiation area where radiation levels exist such that an individual could exceed a deep dose equivalent to the whole body of 1 rem (0.01 sievert) in any one hour at 30 centimeters from the source or from any surface that the radiation penetrates: (1) A control device that prevents entry to the area when high radiation levels exist, or that upon entry, causes the radiation level to be reduced below the level that defines a high radiation area; (2) A device that functions automatically to prevent use or operation of the radiation source or field while individuals are in the area; (3) A control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry; (4) Entryways that are locked. During periods when access to the area is required, positive control over each entry is maintained; (5) Continuous direct or electronic surveillance that is capable of preventing unauthorized entry; (6) A control device that will automatically generate audible and visual alarm signals to alert personnel in the area before use or operation of the radiation source and in sufficient time to permit evacuation of the area or activation of a secondary control device that will prevent use or operation of the source.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
502(c)	Very high radiation areas. In addition to the above requirements, additional measures shall be implemented to ensure individuals are not able to gain unauthorized or inadvertent access to very high radiation areas.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
502(d)	No control(s) shall be established in a high or very high radiation area that would prevent rapid evacuation of personnel.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
601(a)	Except as otherwise provided in this subpart, postings and labels required by this subpart shall include the standard radiation warning trefoil in black or magenta imposed upon a yellow background.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
601(b)	Signs required by this subpart shall be clearly and conspicuously posted and may include radiological protection instructions.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
601(c)	The posting and labeling requirements in this subpart may be modified to reflect the special considerations of DOE activities conducted at private residences or businesses. Such modifications shall provide the same level of protection to individuals as the existing provisions in this subpart.	NA	Ames Laboratory activities that have the potential to result in an individual receiving 100 millirem in a year are not sponsored/conducted at private residences or businesses.

602(a)	Each access point to a controlled area (as defined in § 835.2) shall be posted whenever radiological areas or radioactive material areas exist in the area. Individuals who enter only controlled areas without entering radiological areas or radioactive material areas are not expected to receive a total effective dose equivalent of more than 0.1 rem (0.001 sievert) in a year.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
602(b)	Signs used for this purpose may be selected by the contractor to avoid conflict with local security requirements.	Full	There are no local security requirements at Ames Laboratory that conflict with the choice of sign at the present time.
603	Each access point to radiological areas and radioactive material areas (as defined at § 835.2) shall be posted with conspicuous signs bearing the wording provided in this section.	Full	See responses to § 835.603(a)-(f).
603(a)	Radiation Area. The words "Caution, Radiation Area" shall be posted at each radiation area.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
603(b)	High Radiation Area. The words “Caution, High Radiation Area” or "Danger, High Radiation Area" shall be posted at each high radiation area.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
603(c)	Very High Radiation Area. The words "Grave Danger, Very High Radiation Area" shall be posted at each very high radiation area.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
603(d)	Airborne Radioactivity Area. The words "Caution, Airborne Radioactivity Area" or “Danger, Airborne Radioactivity Area” shall be posted at each airborne radioactivity area.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
603(e)	Contamination Area. The words "Caution, Contamination Area" shall be posted at each contamination area.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
603(f)	High Contamination Area. The words “Caution, High Contamination Area” or "Danger, High Contamination Area" shall be posted at each high contamination area.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
603(g)	Radioactive Material Area. The words “Caution, Radioactive Material(s)” shall be posted at each radioactive material area.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
604(a)	Areas may be excepted from the posting requirements of § 835.603 for periods less than 8 continuous hours when placed under continuous observation and control of an individual knowledgeable of, and empowered to implement, required access and exposure control measures.	Full	Ames Laboratory policies and procedures are consistent with these requirements.

604(b)	Areas may be excepted from the radioactive material area posting requirements of § 835.603(g) when: (1) Posted in accordance with § 835.603(a) through (f); or (2) Each item or container of radioactive material is labeled in accordance with this subpart such that individuals entering the area are made aware of the hazard; or (3) The radioactive material of concern consists solely of structures or installed components which have been activated (i.e. such as by being exposed to neutron radiation or particles produced in an accelerator).	Full	Ames Laboratory policies and procedures are consistent with these requirements.
604(c)	Areas containing only packages received from radioactive material transportation labeled and in non-degraded condition need not be posted in accordance with § 835.603 until the packages are monitored in accordance with § 835.405.	Full	Packages received from radioactive material transportation which are labeled and in non-degraded condition are temporarily isolated in a posted Radioactive Material Area until the monitoring required by § 835.405 can be conducted. Those found to be in a degraded condition are monitored prior to receipt from the carrier.
605	Except as provided in § 835.606, each item or container of radioactive material shall bear a durable, clearly visible label bearing the standard radiation warning trefoil and the words “Caution, Radioactive Material” or “Danger, Radioactive Material.” The label shall also provide sufficient information to permit individuals handling, using, or working in the vicinity of the items or containers, to take precautions to avoid or control exposures.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
606(a)	Items and containers may be excepted from the radioactive material labeling requirements of § 835.605 when: (1) Used, handled, or stored in areas posted and controlled in accordance with this subpart and sufficient information is provided to permit individuals to take precautions to avoid or control exposures; or (2) The quantity of radioactive materials is less than one tenth of the values specified in appendix E of this part; or (3) Packaged, labeled, and marked in accordance with the regulations of the Department of Transportation or DOE Orders governing radioactive material transportation; or (4) Inaccessible, or accessible only to individuals authorized to handle or use them, or to work in the vicinity; or (5) Installed in manufacturing, process, or other equipment, such as reactor components, piping, and tanks; (6) The radioactive material consists solely of nuclear weapons or their components.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
606(b)	Radioactive material labels applied to sealed radioactive sources may be excepted from the color specifications of § 835.601(a).	Full	Ames Laboratory policies and procedures are consistent with these requirements.

701(a)	(a) Records shall be maintained to document compliance with this part and with radiation protection programs required by § 835.101. (b) Unless otherwise specified in this subpart, records shall be retained until final disposition is authorized by DOE.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
702(a)	Records shall be maintained to document doses received by all individuals for whom monitoring was required pursuant to § 835.402 and to document doses received during planned special exposures, unplanned doses exceeding the monitoring thresholds of § 835.402, and authorized emergency exposures.	Full	Records shall be maintained to document doses received by all individuals for whom monitoring was required pursuant to § 835.402 and doses received during accidents and emergency conditions.
702(b)	The results of individual external and internal dose monitoring that is performed, but not required by § 835.402, shall be recorded. Recording of the non-uniform dose equivalent to the skin is not required if the dose is less than 2 percent of the limit specified for the skin at § 835.202(a)(4).	Full	Ames Laboratory policies and procedures are consistent with these requirements.
702(c)	The records required by this section shall: (1) Be sufficient to evaluate compliance with subpart C of this part; (2) Be sufficient to provide dose information necessary to complete reports required by subpart I of this part; (3) Include the following quantities for external dose received during the year: (i) The effective dose equivalent from external sources of radiation (deep dose equivalent may be used as effective dose equivalent for external exposure); (ii) The lens of the eye dose equivalent; (iii) The shallow dose equivalent to the skin; and (iv) The shallow dose equivalent to the extremities. (4) Include the following information for internal dose resulting from intakes received during the year: (i) Committed effective dose equivalent; (ii) Committed dose equivalent to any organ or tissue of concern; and (iii) Identity of radionuclides. (5) Include the following quantities for the summation of the external and internal dose: (i) Total effective dose equivalent in a year; (ii) For any organ or tissue assigned an internal dose during the year, the sum of the deep dose equivalent from external exposures and the committed dose equivalent to that organ or tissue; and (iii) Cumulative total effective dose equivalent. (6) Include the dose equivalent to the embryo/fetus of a declared pregnant worker.	Full	Ames Laboratory policies and procedures are consistent with these requirements.

702(d)	Documentation of all occupational doses received during the current year, except for doses resulting from planned special exposures conducted in compliance with § 835.204 and emergency exposures authorized in accordance with § 835.1302(d), shall be obtained to demonstrate compliance with § 835.202(a). If complete records documenting previous occupational dose during the year cannot be obtained, a written estimate signed by the individual may be accepted to demonstrate compliance.	Full	Documentation of all occupational exposure (see response to § 835.202(b)) shall be retained to demonstrate compliance with § 835.202(a). In the absence of formal records of previous occupational exposure during the year, a written estimate signed by the individual may be accepted.
702(e)	For radiological workers whose occupational dose is monitored in accordance with §835.402, reasonable efforts shall be made to obtain complete records of prior years occupational internal and external doses.	Full	Efforts shall be made to obtain records of prior years occupational internal and external exposure for those on permanent dosimetry service. When requesting a permanent dosimeter, the individual is asked to provide information on sources of previous occupational radiation exposure. The Health Physics Group makes a written request of previous employers to provide exposure histories for the individual, in order to make a reasonable effort to recover records of prior exposure.
702(f)	The records specified in this section that are identified with a specific individual shall be readily available to that individual.	Full	Monitoring records associated with a specific individual, upon written request, shall be made available to that individual in accordance with Privacy Act requirements.
702(g)	Data necessary for future verification or reassessment of the recorded doses shall be recorded.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
702(h)	All records required by this section shall be transferred to the DOE upon cessation of activities at the site that could cause exposure to individuals.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
703(a)	The following information shall be documented and maintained: (a) Results of monitoring for radiation and radioactive material as required by subparts E and L of this part, except for monitoring required by §835.1102(d); (b) Results of monitoring used to determine individual occupational dose from external and internal sources; (c) Results of monitoring for the release and control of material and equipment as required by §835.1101; and (d) Results of maintenance and calibration performed on instruments and equipment as required by §835.401(b).	Full	Ames Laboratory policies and procedures are consistent with these requirements.

704(a)	(a) Training records shall be maintained, as necessary, to demonstrate compliance with § 835.901. (b) Actions taken to maintain occupational exposures as low as reasonably achievable, including the actions required for this purpose by § 835.101, as well as facility design and control actions required by § 835.1001, § 835.1002, and § 835.1003, shall be documented. (c) Records shall be maintained to document the results of internal audits and other reviews of program content and implementation. (d) Written declarations of pregnancy, including the estimated date of conception, and revocations of declarations of pregnancy shall be maintained. (e) Changes in equipment, techniques, and procedures used for monitoring shall be documented. (f) Records shall be maintained as necessary to demonstrate compliance with the requirements of §§ 835.1201 and 835.1202 for sealed radioactive source control, inventory, and source leak tests.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
801(a)	Radiation exposure data for individuals monitored in accordance with § 835.402 shall be reported as specified in this section. The information shall include the data required under § 835.702(c). Each notification and report shall be in writing and include: the DOE site or facility name, the name of the individual, the individual's social security number, employee number, or other unique identification number.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
801(b)	Upon the request from an individual terminating employment, records of exposure shall be provided to that individual as soon as the data are available, but not later than 90 days after termination. A written estimate of the radiation dose received by that employee based on available information shall be provided at the time of termination, if requested.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
801(c)	Each DOE- or DOE-contractor-operated site or facility shall, on an annual basis, provide a radiation dose report to each individual monitored during the year at that site or facility in accordance with § 835.402.	Full	Ames Laboratory shall make reasonable efforts to provide an annual radiation dose report to each individual who is monitored during the calendar year. For those individuals who are not on-site, the annual radiation dose report will be sent to the last known address of the individual.
801(d)	Detailed information concerning any individual's exposure shall be made available to the individual upon request of that individual, consistent with the provisions of the Privacy Act (5 U.S.C. 552a).	Full	Consistent with the provisions of the Privacy Act and subsequent revisions, detailed information concerning any individual's exposure shall be made available to the individual upon a written request.

801(e)	When a DOE contractor is required to report to the Department, pursuant to Departmental requirements for occurrence reporting and processing, any exposure of an individual to radiation and/or radioactive material, or planned special exposure in accordance with § 835.204(e), the contractor shall also provide that individual with a report on his or her exposure data included therein. Such report shall be transmitted at a time not later than the transmittal to the Department.	Full	When Ames Laboratory is required to report to the Department of Energy, pursuant to DOE requirements for occurrence reporting and processing, any exposure of an individual to radiation and/or radioactive material, Ames Laboratory will provide the affected individual with a report on his/her exposure included in the report to DOE. Such a report shall be sent to the individual at a time no later than the transmittal to the Department.
901(a)	Each individual shall complete radiation safety training on the topics established at § 835.901(c) commensurate with the hazards in the area and the required controls: (1) Before being permitted unescorted access to controlled areas; and (2) Before receiving occupational dose during access to controlled areas at a DOE site or facility.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
901(b)	Each individual shall demonstrate knowledge of the radiation safety training topics established in § 835.901(c), commensurate with the hazards in the area and the required controls, by successful completion of an examination and performance demonstrations: (1) Before being permitted unescorted access to radiological areas; and (2) Before performing unescorted assignments as a radiological worker.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
901(c)	Radiation safety training shall include the following topics, to the extent appropriate to each individual's prior training, work assignments, and degree of exposure to potential radiological hazards; (1) Risks of exposure to radiation and radioactive materials, including prenatal radiation exposure; (2) Basic radiological fundamentals and radiation protection concepts; (3) Physical design features, administrative controls, limits, policies, procedures, alarms, and other measures implemented at the facility to manage doses and maintain doses ALARA, including both routine and emergency actions; (4) Individual rights and responsibilities as related to implementation of the facility radiation protection program; (5) Individual responsibilities for implementing ALARA measures required by § 835.101; and (6) Individual exposure reports that may be requested in accordance with §835.801.	Full	Ames Laboratory policies and procedures are consistent with these requirements.

901(d)	When an escort is used in lieu of training in accordance with paragraph (a) or (b) of this section, the escort shall: (1) Have completed radiation safety training, examinations, and performance demonstrations required for entry to the area and performance of the work; and (2) Ensure that all escorted individuals comply with the documented radiation protection program.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
901(e)	Radiation safety training shall be provided to individuals when there is a significant change to radiation protection policies and procedures that may affect the individual and at intervals not to exceed 24 months. Such training provided for individuals subject to the requirements of § 835.901(b)(1) and (b)(2) shall include successful completion of an examination.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1001(a)	Measures shall be taken to maintain radiation exposure in controlled areas ALARA through physical design features and administrative control. The primary methods used shall be physical design features (e.g., confinement, ventilation, remote handling, and shielding). Administrative controls shall be employed only as supplemental methods to control radiation exposure.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1001(b)	For specific activities where use of physical design features is demonstrated to be impractical, administrative controls shall be used to maintain radiation exposures ALARA.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1002(a)	During the design of new facilities or modification of existing facilities, the following objectives shall be adopted: Optimization methods shall be used to assure that occupational exposure is maintained ALARA in developing and justifying facility design and physical controls.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1002(b)	During the design of new facilities or modification of existing facilities, the following objectives shall be adopted: The design objective for controlling personnel exposure from external sources of radiation in areas of continuous occupational occupancy (2000 hours per year) shall be to maintain exposure levels below an average of 0.5 millirem (5 microsieverts) per hour and as far below this average as is reasonably achievable. The design objectives for exposure rates for potential exposure to a radiological worker where occupancy differs from the above shall be ALARA and shall not exceed 20 percent of the applicable standards in § 835.202.	Full	Ames Laboratory policies and procedures are consistent with these requirements.

1002(c)	During the design of new facilities or modification of existing facilities, the following objectives shall be adopted: Regarding the control of airborne radioactive material, the design objective shall be, under normal conditions, to avoid releases to the workplace atmosphere and in any situation, to control the inhalation of such material by workers to levels that are ALARA; confinement and ventilation shall normally be used.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1002(d)	During the design of new facilities or modification of existing facilities, the following objectives shall be adopted: The design or modification of a facility and the selection of materials shall include features that facilitate operations, maintenance, decontamination, and decommissioning.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1003	During routine operations, the combination of physical design features and administrative controls shall provide that: (a) The anticipated occupational dose to general employees shall not exceed the limits established at § 835.202; and (b) The ALARA process is utilized for personnel exposures to ionizing radiation.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1101(a)	Except as provided in paragraphs (b) and (c) of this section, material and equipment in contamination areas, high contamination areas, and airborne radioactivity areas shall not be released to a controlled area if: (1) Removable surface contamination levels on accessible surfaces exceed the removable surface contamination values specified in appendix D of this part; or (2) Prior use suggests that the removal surface contamination levels on inaccessible surfaces are likely to exceed the removable surface contamination values specified in appendix D of this part.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1101(b)	Material and equipment exceeding the removable surface contamination values specified in appendix D of this part may be conditionally released for movement on-site from one radiological area for immediate placement in another radiological area only if appropriate monitoring is performed and appropriate controls for the movement are established and exercised.	Full	Ames Laboratory policies and procedures are consistent with these requirements.

1101(c)	Material and equipment with fixed contamination levels that exceed the total contamination values specified in appendix D of this part may be released for use in controlled areas outside of radiological areas only under the following conditions: (1) Removable surface contamination levels are below the removable surface contamination values specified in appendix D of this part; and (2) The material or equipment is routinely monitored and clearly marked or labeled to alert personnel of the contaminated status.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1102(a)	Appropriate controls shall be maintained and verified which prevent the inadvertent transfer of removable contamination to locations outside of radiological areas under normal operating conditions.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1102(b)	Any area in which contamination levels exceed the values specified in appendix D of this part shall be controlled in a manner commensurate with the physical and chemical characteristics of the contaminant, the radionuclides present, and the fixed and removable surface contamination levels.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1102(c)	Areas accessible to individuals where the measured total surface contamination levels exceed, but the removable surface contamination levels are less than, corresponding surface contamination values specified in appendix D of this part, shall be controlled as follows when located outside of radiological areas: (1) The area shall be routinely monitored to ensure the removable surface contamination level remains below the removable surface contamination values specified in appendix D of this part; and (2) The area shall be conspicuously marked to warn individuals of the contaminated status.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1102(d)	Individuals exiting contamination, high contamination, or airborne radioactivity areas shall be monitored, as appropriate, for the presence of surface contamination.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1102(e)	Protective clothing shall be required for entry to areas in which removable contamination exists at levels exceeding the removable surface contamination values specified in appendix D of this part.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1201	Sealed radioactive sources shall be used, handled, and stored in a manner commensurate with the hazards associated with operations involving the sources.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1202(a)	Each accountable sealed radioactive source shall be inventoried at intervals not to exceed six months. This inventory shall: (1) Establish the location of each accountable sealed radioactive source; (2) Verify the presence and adequacy of associated postings and labels; and (3) Establish the adequacy of storage locations, containers, and devices.	Full	Ames Laboratory policies and procedures are consistent with these requirements.

1202(b)	Except for sealed radioactive sources consisting solely of gaseous radioactive material or tritium, each accountable sealed radioactive source shall be subject to a source leak test upon receipt, when damage is suspected, and at intervals not to exceed 6 months. Source leak tests shall be capable of detecting radioactive material leakage equal to or exceeding 0.005 microcurie.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1202(c)	Notwithstanding the requirements of paragraph (b) of this section, an accountable sealed radioactive source is not subject to the periodic source leak testing if that source has been removed from service. Such sources shall be stored in a controlled location, subject to periodic inventory as required by paragraph (a) of this section, and subject to source leak testing prior to being returned to service.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1202(d)	Notwithstanding the requirements of paragraphs (a) and (b) of this section, an accountable sealed radioactive source is not subject to periodic inventory and source leak testing if that source is located in an area that is unsafe for human entry or otherwise inaccessible.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1202(e)	An accountable sealed radioactive source found to be leaking radioactive material shall be controlled in a manner that minimizes the spread of radioactive contamination.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1301(a)	A general employee whose occupational dose has exceeded the numerical value of any of the limits specified in § 835.202 as a result of an authorized emergency exposure may be permitted to return to work in radiological areas during the current year providing that all of the following conditions are met: (1) Approval is first obtained from the contractor management and the Head of the responsible DOE field organization; (2) The individual receives counseling from radiological protection and medical personnel regarding the consequences of receiving additional occupational exposure during the year; and (3) The affected employee agrees to return to radiological work.	Full	A general employee whose occupational exposure has exceeded the numerical values of any of the limits specified in § 835.202 as a result of an authorized emergency exposure may be permitted to return to work in radiological areas during the current year providing that all of the following conditions are met: (1) Approval is first obtained from Laboratory Management and DOE-CH Ames Group Manager; (2) The individual receives counseling from radiological protection and medical personnel regarding the consequences of receiving additional occupational exposure during the year; and (3) The affected employee agrees to return to radiological work by indicating his/her desire in writing.
1301(b)	All doses exceeding the limits specified in § 835.202 shall be recorded in the affected individual's occupational dose record.	Full	All assessed doses are recorded in the affected individual's occupational dose record.

1301(c)	When the conditions under which a dose was received in excess of the limits specified in § 835.202, except those doses received in accordance with § 835.204, have been eliminated, operating management shall notify the Head of the responsible DOE field organization.	Full	When the conditions under which the radiological emergency or accidental radiation exposures were received have been eliminated, the Ames Laboratory Director, or designee, shall notify the DOE-CH Ames Group Manager.

1301(d)	Operations after a dose was received in excess of the limits specified in § 835.202, except those received in accordance with § 835.204, may be resumed only with the approval of DOE.	Full	Operations suspended after a radiological emergency or accidental radiation exposure in excess of the limits specified in § 835.202 may only be resumed with the approval of the DOE-CH Ames Group Manager.
1302(a)	The risk of injury to those individuals involved in rescue and recovery operations shall be minimized.	Full	In developing the rescue and recovery plan, measures, as dictated by the specific situation, shall be taken such that the risk of injury to those individuals involved in rescue and recovery operations is be minimized.
1302(b)	Operating management shall weigh actual and potential risks against the benefits to be gained.	Full	Prior to incurring any emergency exposure, operating management shall weigh actual and potential risks to rescue and recover individuals against the benefits to be gained.
1302(c)	No individual shall be required to perform rescue action that might involve substantial personal risk.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1302(d)	Each individual authorized to perform emergency actions likely to result in occupational doses exceeding the values of the limits provided at § 835.202(a) shall be trained in accordance with § 835.901(b) and briefed beforehand on the known or anticipated hazards to which the individual will be subjected.	Full	Ames Laboratory policies and procedures are consistent with these requirements.
1304(a)	Installations possessing sufficient quantities of fissile material to potentially constitute a critical mass, such that the excessive exposure of individuals to radiation from a nuclear accident is possible, shall provide nuclear accident dosimetry for those individuals.	NA	Ames Laboratory does not maintain an inventory of special nuclear materials such that sufficient quantities of fissile material are present to potentially constitute a critical mass. Given this, exposure of personnel to radiation from a nuclear criticality accident is not possible and Ames Laboratory personnel are not provided nuclear accident dosimetry and Ames Laboratory does not require the installation of criticality alarm systems. Should the inventory of special nuclear materials be increased to potentially constitute a critical mass, Ames Laboratory will review and revise its RPP accordingly.
1304(b)	Nuclear accident dosimetry shall include the following: (1) A method to conduct initial screening of individuals involved in a nuclear accident to determine whether significant exposures to radiation occurred; (2) Methods and equipment for analysis of biological materials; (3) A system of fixed nuclear accident dosimeter units; and (4) Personal nuclear accident dosimeters.	NA	As Ames Laboratory personnel are not provided nuclear accident dosimetry for the reason stated in the response to 1304(a), this requirement is not applicable.